Fafeicy DYP-ME007YS

Fafeicy Ultrasonic Module DYP-ME007YS (PWM Output) Instruction Manual

1. Introduction

This manual provides detailed instructions for the Fafeicy DYP-ME007YS Ultrasonic Module with PWM Output. This module is designed for accurate distance measurement using ultrasonic waves, offering a reliable solution for various applications requiring proximity sensing.

2. Product Overview

The Fafeicy DYP-ME007YS is an ultrasonic distance measuring transducer module featuring a separate main board and probe design for enhanced durability and adaptability. It provides a Pulse Width Modulation (PWM) output for distance data.

Key Features:

- **Enhanced Durability:** The main board is separated from the probe, contributing to improved product longevity.
- **Environmental Adaptability:** Designed to be waterproof and dustproof, allowing for stable operation in various environments.
- **Wide Application:** Suitable for diverse uses such as parking assistance, CNC inspection, and vehicle sensing.



Figure 2.1: Fafeicy DYP-ME007YS Ultrasonic Module, showing the main control board, connecting cable, and the ultrasonic sensor probe.

3. Specifications

Parameter	Value
Model	DYP-ME007YS
Working Voltage	DC 3.3-5V
Working Current	20mA
Measurement Mode	Plane measurement mode
Measuring Distance	Approx. 28 ~ 450cm (11.02 ~ 177.17in)
Output Type	PWM Output
Item Weight	1.41 ounces
Product Dimensions	5.91 x 3.54 x 0.79 inches

4. Setup

This section outlines the basic steps for connecting and preparing your DYP-ME007YS module for operation.

4.1 Connection Diagram

The module typically features a 4-pin connector for power and signal. Ensure correct polarity when connecting to avoid damage.

- **VCC:** Power supply input (DC 3.3-5V).
- **GND:** Ground connection.
- **OUT:** PWM output signal pin.
- **NC:** Not connected (or sometimes used for trigger/echo in other variants, but for PWM output, typically only 3 pins are active).



Figure 4.1: The DYP-ME007YS module with its 4-pin connector, ready for integration into a circuit.

4.2 Installation Considerations

- Mount the ultrasonic sensor probe in a location where its path is unobstructed.
- Avoid placing the sensor near sources of strong electromagnetic interference.
- Ensure the sensor is securely fastened to prevent vibrations that could affect readings.

5. Operating Instructions

The DYP-ME007YS module provides distance measurements via a PWM signal. The duration of the high pulse on the OUT pin is proportional to the measured distance.

5.1 Principle of Operation

The module emits an ultrasonic pulse and measures the time it takes for the pulse to return after reflecting off an object. This time-of-flight is then converted into a distance value, which is represented by the width of the PWM pulse.

5.2 Reading PWM Output

To obtain the distance, an external microcontroller (e.g., Arduino, Raspberry Pi) must measure the duration of the high pulse on the OUT pin. The relationship between pulse width and distance is typically:

> **Distance (cm) = (Pulse Width (µs) / 58)**

Where:

- **Pulse Width:** The duration of the high signal on the OUT pin, measured in microseconds (µs).
- **58:** A constant derived from the speed of sound in air (approximately 343 meters/second or 0.0343 cm/µs), accounting for the round trip.

For example, if the pulse width is 1740 µs, the distance would be 1740 / 58 = 30 cm.



Figure 5.1: Close-up view of the ultrasonic sensor probe, responsible for emitting and receiving sound waves.

6. Maintenance

The DYP-ME007YS module is designed for durability and requires minimal maintenance. Adhering to these guidelines will help ensure its longevity and accurate performance.

- **Cleaning:** Periodically inspect the ultrasonic sensor probe for dust or debris. Gently clean the surface with a soft, dry cloth. Avoid using abrasive materials or harsh chemicals.
- **Environmental Protection:** While the module is waterproof and dustproof, avoid prolonged exposure to extreme temperatures, direct sunlight, or highly corrosive environments.
- **Cable Integrity:** Ensure all connecting cables are free from kinks, cuts, or damage. Damaged cables can lead to intermittent readings or module failure.
- **Power Supply:** Always use a stable power supply within the specified voltage range (DC 3.3-5V). Fluctuations can affect performance or damage the module.

7. Troubleshooting

If you encounter issues with your DYP-ME007YS module, refer to the following troubleshooting steps:

7.1 No Readings or Erratic Readings

- **Check Power Supply:** Verify that the module is receiving the correct voltage (3.3-5V DC) and that the ground connection is secure.
- **Inspect Connections:** Ensure all pins (VCC, GND, OUT) are correctly connected to your microcontroller or circuit. Loose connections can cause instability.
- **Obstruction Check:** Confirm that there are no physical obstructions directly in front of the ultrasonic sensor probe that could block the sound waves.
- **Environmental Factors:** Strong air currents, very soft or sound-absorbing targets, or other ultrasonic devices nearby can interfere with readings. Try testing in a controlled environment.
- **Target Surface:** Highly reflective or very small objects may be difficult for the sensor to detect reliably. Ensure the target surface is large enough and not excessively angled.

7.2 Incorrect Distance Readings

- **Recalculate:** Double-check your distance calculation formula and ensure the pulse width measurement is accurate.
- **Temperature Effects:** The speed of sound varies with temperature. For highly precise applications, consider temperature compensation.
- **Measurement Range:** Ensure the target is within the specified measuring distance of 28 cm to 450 cm. Objects too close or too far may yield inaccurate results.
- **Software Logic:** Review your microcontroller code to ensure the pulse width is being read correctly and the conversion to distance is implemented accurately.

8. Warranty and Support

Fafeicy is committed to product quality and customer satisfaction. If you have any questions regarding your DYP-ME007YS module or encounter issues not covered in this manual, please contact our customer support.

- **After-Sales Support:** For any order-related inquiries or technical assistance, please reach out to us directly. We aim to respond within 24 hours.
- **Warranty Information:** Specific warranty details may vary by region and retailer. Please refer to your purchase documentation for comprehensive warranty terms.

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